SARA Title III Section 313
Inspection Log Sheet

Report Number:	06-313U-019
Facility:	Ashland Specialty Chemical Co.
Location:	2801 Christopher Columbus Blvd. Philadelphia, PA 19148
Date of Inspection:	April 10, 2006
Date Report Completed:	May 2, 2006
Preliminary Compliance Determination:	No evidence of violations
Date Referred to ORC for Review/Concurrence:	
Date Administrative Complaint signed:	
Date Withdrawn:	
Date of Close-Out:	May 2, 2006
Comments:	

SARA TITLE III SECTION 313 INSPECTION REPORT
06-313U-019

I. **Facility**
Ashland Specialty Chemical Company
2801 Christopher Columbus Blvd.
Philadelphia, PA 19148

SIC:
2821

II. **Date of Inspection**
April 10, 2006

III. **EPA Inspector**
Craig E. Yussen CEY 5/2/06
Chemical Engineer
Toxics Programs & Enforcement Branch (3WC33)
(215) 814-2151

IV. **Company Officials**
Abgail Davis, Process Engineer (215) 446-7929
Robert L. Shelton, Plant Manager, Composite Polymers (215) 446-7900

V. **Purpose of Inspection**

Ashland Specialty Chemical Company is a solvent based, unsaturated plyester resins and vinyl esters and has submitted a toxic chemical release report Form R or Form A for several chemicals under Section 313 of SARA Title III for calendar years 2002, 2003, and 2004. This inspection was conducted to verify whether the facility fulfilled its reporting requirements under 40 C.F.R. Part 372 under Section 313 of SARA Title III for those years.

VI. **Opening Conference**

1. **Inspection Procedures and General Information**

On April 10, 2006, a Section 313 inspection was conducted at Ashland Specialty Chemical Company 15 days prior to the inspection, a letter was sent to the company confirming the date of the inspection (attachment C). The EPA inspector met with company representatives at 8:30 a.m. The inspector's credentials were presented and a Notice of Inspection was presented and explained. Mr. Shelton signed the notice and an outline of the areas to be investigated was discussed.

2. Facility Description

Ashland Specialty Chemical Company's Philadelphia, PA plant is a producer of various solvent-based, unsaturated polyester resins and vinyl esters for numerous applications such as auto plastics, countertops, boats, and building materials. Polyesters are manufactured by high temperature (375-450F) reaction of acids and glycols. Vinyl ester resins are produced by chemical reaction of epoxy resins with glacial methacrylic acid at temperatures ranging from 250-300F. The resins are diluted with solvents, especially styrene and methyl methacrylate, and are then blended with additives to achieve the desired properties. The Philadelphia, PA site is one of several sites owned and operated by Ashland Chemical Company worldwide. Corporate headquarters are located in Dayton, OH.

The Philadelphia, PA site was initially constructed in 1918 by the Grove Linseed Oil Company, which specialized in the production of varnish and alkyd resins. The plant was sold to the Cargill Company in 1964 and was later purchased by Ashland Chemicals in 1980.

Currently, the site encompasses approximately 4 acres. The principal site activities include shipping, manufacturing, warehousing, quality control, waste treatment, and administration. The manufacturing occurs in a three-story building which contains all the reactors, blending tanks, and process control areas. Warehousing of raw material and finished products, contained in metal pressure relieving style drums, occurs in another building. A third building, located at the west end of the site, houses the administration offices and meeting rooms. A fourth building includes additional offices, a maintenance shop, and spare parts storage. On the outside, the facility includes large silos for raw materials and finished products and a waste heat boiler for process waste. Since it purchased the site, Ashland invested several million dollars in enhancements in plant safety, environmental controls, materials handling, and automated process control.

The facility currently employs approximately 50 people. Ms. Abgail Davis, Process Engineer, is primarily responsible for completion of the Form R's for the site.

VII. SARA Title III

Section 313 was the primary focus of the inspection. A letter notifying the facility of the inspection was sent to the facility on March 24, 2006.

A plant, factory, or other facility comes under the provisions of Section 313:

1. has a primary Standard Industrial Classification ("SIC") code (as in effect on January 1, 1987) between 2000 and 3999, or, starting January 1, 1998, has a SIC code in one or more of the following categories:
    - A. between 1000 and 1099, except 1011, 1081, and 1094;
    - B. between 1200 and 1299, except 1241;
    - C. 4911, 4931, or 4939 (limited to facilities that combust coal and/or oil for the purpose of generating

power for distribution in commerce);

D. 4953 (limited to facilities regulated under Resource Conservation and Recovery Act, subtitle C, 42 U.S.C. § 6921 et. seq.);

E. 5169 or 5171;

F. 7389 (limited to facilities primarily engaged in solvent recovery services on a contract or fee basis); and

2. If, in addition, it has 10 or more full-time employees; and

3. If it manufactures (including imports) or processes more than 75,000 pounds of a listed toxic chemical during calendar year 1987 or manufactures (including imports) or processes more than 50,000 lbs. during calendar year 1988, or manufactures (including imports) or processes more than 25,000 lbs. during calendar year 1989 or later, or otherwise uses more than 10,000 pounds of a listed toxic chemical during any calendar year;

or, starting calendar year 2000, manufactured, processed, or "otherwise-used" the following chemicals in at least the following amounts during the calendar year for which the form is required:

100 pounds -	aldrin, methoxychlor, pendimethalin, polycyclic aromatic compounds, tetrabromobisphenyl A, trifluralin;
10 pounds -	chlordane, heptachlor, mercury, toxaphene, isodrin, polychorinated biphenyls, benzo(g,h,i)perylene, hexachlorobenzene, mercury compounds, octachlorostyrene, pentachlorobenzene;
0.1 grams -	dioxin and dioxin-like compounds,

or, starting calendar year 2001, manufactured, process, or "otherwise-used" the following chemicals in at least the following amounts during the calendar year for which the form is required:

100 pounds -	lead which is not contained in a stainless steel, brass, or bronze alloy;
100 pounds -	lead compounds

The facility stated that the plant's primary SIC Code is 2821 and that the facility had approximately 50 employees in 2002, 2003, and 2004. As indicated earlier, the facility reported for several chemicals for calendar years 2002, 2003, and 2004. The remainder of the inspection involved the following:

1. Determining whether the plant fulfilled its reporting requirements for calendar years 2002, 2003, and 2004 for all chemicals it should have reported;

2. Determining the validity of the data on the chemicals the facility reported for calendar years 2002, 2003 and 2004.

Chemical Usage

Chemical usage records for calendar years 2002, 2003, and 2004 are included as part of documents 5 - 9. The calculations were derived from inventory lists and throughput records. According to the information provided by the facility, the facility's EPCRA Section 313 chemical usages during 2002, 2003, and 2004 were as follows (all figures are in pounds):

Reporting Year	Chemical	Activity (lb) M-Manufacture P-Processed O-Oth. Used	Toxic Chemical Release Report Filed
2002	4,4-Isopropylidenediphenol	224,361 (P)	Form A
2002	Chlorendic Acid	295,932 (P)	Form A
2002	Cobalt Compounds	43,413(P)	Form A
2002	N,N-dimethylanilene	26,246 (P)	Form A
2002	Dicyclopentadiene	14,541,861 (P)	Form R
2002	Ethylene Glycol	3,488,871 (P)	Form R
2002	Maleic Anhydride	14,860,287 (P)	Form R
2002	Methyl Methacrylate	652,845 (P)	Form R
2002	Phthalic Anhydride	4,004,626 (P)	Form R
2002	Styrene	27,253,308 (P)	Form R
2002	Tetrabromobisphenol A	201,099 (P)	Form R
2002	Manganese compounds	0 (P)	none
2002	Copper compounds	1,083(P)	none
2002	Zinc compounds	1,746 (P)	none
2002	Octamethylcyclotetrasiloxane	201 (P)	none
2002	Xylene	922 (P)	none
2002	1,2,4-Trimethylbenzene	13,484 (P)	none
2002	2-Butoxyethanol	1,033 (P)	none
2002	Hydroquinone	8,493 (P)	none
2002	Methanol	6,129 (P)	none

2003	4,4-Isopropylidenediphenol	331,725 (P)	Form A
2003	Chlorendic Acid	292,288 (P)	Form A
2003	Cobalt Compounds	46,212(P)	Form A
2003	N,N-dimethylanilene	22,198 (P)	Form A
2003	Dicyclopentadiene	14,504,439 (P)	Form R
2003	Ethylene Glycol	3,231,906 (P)	Form R
2003	Maleic Anhydride	15,194,923 (P)	Form R
2003	Methyl Methacrylate	589,970 (P)	Form R
2003	Phthalic Anhydride	4,637,626 (P)	Form R
2003	Styrene	26,954,649 (P)	Form R
2003	Tetrabromobisphenol A	302,442 (P)	Form R
2003	Manganese compounds	201 (P)	none
2003	Copper compounds	1,370 (P)	none
2003	Zinc compounds	1,428 (P)	none
2003	Octamethylcyclotetrasiloxane	75 (P)	none
2003	Xylene	466 (P)	none
2003	1,2,4-Trimethylbenzene	9,507 (P)	none
2003	2-Butoxyethanol	1,550 (P)	none
2003	Hydroquinone	7,985 (P)	none
2003	Methanol	4,927 (P)	none
2004	4,4-Isopropylidenediphenol	299,511 (P)	Form A
2004	Chlorendic Acid	242,912 (P)	Form A
2004	Cobalt Compounds	56,580 (P)	Form A
2004	N,N-dimethylanilene	29,490 (P)	Form A
2004	Dicyclopentadiene	17,769,806 (P)	Form R
2004	Ethylene Glycol	3,800,021 (P)	Form R
2004	Maleic Anhydride	18,662,343(P)	Form R
2004	Methyl Methacrylate	627,542 (P)	Form R
2004	Phthalic Anhydride	6,129,092 (P)	Form R
2004	Styrene	30,706,473 (P)	Form R

2004	Tetrabromobisphenol A	63,163 (P)	Form R
2004	Manganese compounds	0 (P)	none
2004	Copper compounds	1,382 (P)	none
2004	Zinc compounds	1,284 (P)	none
2004	Octamethylcyclotetrasiloxane	144 (P)	none
2004	Xylene	509 (P)	none
2004	1,2,4-Trimethylbenzene	14,089 (P)	none
2004	2-Butoxyethanol	1,105 (P)	none
2004	Hydroquinone	10,126 (P)	none
2004	Methanol	5,261 (P)	none

All chemicals identified above were processed either as reactants or formulation components. The facility was apparently under the 25,000 pound threshold for N,N-dimethylanilene for 2003, but filed a Form A, although it wasn't required to do so.

Data Quality

As indicated in the table above, the facility filed Form A's in lieu of Form R's for several chemicals for calendar years 2002, 2003, and 2004. According to 40 C.F.R. Section 372.27, the facility is entitled to submit a Form A (a two-page certification form) instead of a Form R for a given chemical for a given calendar year if it:

A. meets the basic SIC code, threshold, and employee criteria;
B. manufactures, process, or otherwise-uses less than 1,000,000 pounds of that chemical during that year;
C. it generated a reportable amount of that chemical of less than 500 pounds during that year (the reportable amount consists of the summation of the quantity released, the quantity used for energy recovery on-site, the quantity used for energy recovery off-site, the quantity recycled on-site, the quantity recycled offsite, the quantity treated on-site, and the quantity treated off-site).

The inspector calculated the reportable amounts from the data the facility provided in documents 6-10 as follows (all figs. in pounds):

Year	Chemical	Total Releases (onsite + offsite)	Total onsite + offsite energy recovery	Total onsite + offsite recycling	Total onsite + offsite treatment	Total report-able amount
2002	4,4-Isopropylidene-diphenol	22.4	0	0	0	22.4
2002	Chlorendic Acid	29.6	0	0	268.0	297.6
2002	Cobalt Compounds	58.4	0	0	0	58.4
2002	N,N-dimethylanilene	65.0	0	0	0	65.0
2003	4,4-Isopropylidene-diphenol	33.2	0	0	0	33.2
2003	Chlorendic Acid	29.2	0	0	147.8	177.0
2003	Cobalt Compounds	59.9	0	0	0	59.9
2003	N,N-dimethylanilene (amount processed was under 25,000 pound threshold)	-	-	-	-	-
2004	4,4-Isopropylidene-diphenol	30.0	0	0	0	30.0
2004	Chlorendic Acid	24.3	54.0	0	0	78.3
2004	Cobalt Compounds	91.8	0	0	0	91.8
2004	N,N-dimethylanilene	82.1	0	0	0	82.1

The facility timely filed the full Form R's for other chemicals for calendar years 2002, 2003, and 2004 and hardcopies were made available to the inspector for review. Prior to the inspection, the inspector had access to the facility's TRI data for all three years through EPA's Envirofacts Database. A summary of the facility's TRI data from Envirofacts is included in the report. The inspector analyzed the Form R data versus the supporting documentation in documents 6-14.

The facility's air emissions occurred mainly from the raw material storage area, the reactors, the thinning and blending tanks, and the product storage and loading areas. Fugitive air emissions, occurring

largely through valves, pump seals, flanges, and sample points were calculated by published emission factors using computerized algorithms. Stack emissions, mainly through thrgouth the process equipment's atmospheric vents, and pressure relief devices, as well as the fume afterburner stack, were also computed using published emission factors. The inspector noted that the fugitive air emission values for all Form R reported chemicals for calendar years 2003 and 2004 was significantly greater than those reported for 2002. According to Ms. Davis and Mr. Shelton, the reason for these differences is that a different set of emission factors was used for the latter two years. These factors were recommended by the Dayton, OH facility's corporate environmental manager, who advised Ms. Davis that such factors would yield more accurate results. The inspector also noted that the fugitive air emissions for each Form R reported chemical for calendar years 2003 and 2004 were reported as identical. After an analysis of the data, Ms. Davis informed the inspector that the algorithm used to compute the 2003 fugitive emissions was mistakenly carried over for 2004. During the inspection, Ms. Davis implemented the correct formula for the 2004 fugitive emissions. The reported values and corrected values for fugitive air emissions for 2004 appear as follows:

Year	Chemical	Reported Value of Fugitive Air Emissions	Correct Value of Fugitive Air Emissions
2004	Dicyclopentadiene	1,100	1,127
2004	Ethylene Glycol	561	563
2004	Malic Anhydride	792	807
2004	Methyl Methacrylate	1,202	1,204
2004	Phthalic Anhydride	849	850
2004	Styrene	3,136	3,305

As indicated in the table above, the corrected values are not significantly different from the reported values. Ms. Davis and Mr. Shelton informed the inspector that fugitive air emissions are not directly proportional to chemical usage - each of the fugitive emissions calculations has two components: 1) a "stagnant component" computed for material embedded in the pipeline during non-operational times; and 2) a "flowing" component for additional material is charged into the process. During the majority of the time, the process is in the "stagnant" mode, in which the air emissions vary negligibly from year to year.

Regarding chemical releases to other environmental media, he facility reported no releases to water or land. A minute amount of styrene (1 pound) was reported as transferred offsite to a publicly owned treatment works (POTW) during 2002 - 2004. All other chemical batches transferred offsite were sent to various waste treatment plants, mainly for either incineration or energy recovery.

Except for the fugitive air emissions for 2004, the inspector found no discrepancies between the values reported in the Form R's and the values

in the supporting documents.

VIII. Closing Conference

Appropriate documents were requested by the EPA Inspector and the SARA Title III Section 313 investigation was concluded.

IX. Attachments

A. Notice of Inspection
B. Receipt for Samples and Documents
1. Site History and Description
2. Contractor Safety & Training Manual
3. Material Flow Sheet
4. Philadelphia, PA Plant Organization Chart
5. 2002 Raw Material Usage
6. Regulated Chemical List - 2003& 2004
7. SARA 313 - 2002 Data
8. SARA 313 - 2003 Data
9. SARA 313 - 2004 Data
10. Offsite Waste Shipments for 2002
11. Customer Shipping Report from 1/1/02 to 12/31/02
12. Offsite Waste Shipments for 2003
13. Customer Shipping Report from 1/1/03 to 12/31/03
14. Offsite Waste Shipments for 2004
15. Customer Shipping Report from 1/1/04 to 12/31/04
16. SARA 313 - 2004 Data With Corrected Fugitive Emission Factors

Summary of Findings

On April 10, 2006, an EPCRA Section 313 inspection was conducted at Ashland Specialty Chemical Company, located in Philadelphia, PA. The facility's usage records and toxic chemical reporting data for calendar years 2002, 2003, and 2004 were analyzed by the inspector. After review, the inspector concluded that the facility filed the required Form R/Form A for each toxic chemical whose applicable activity exceeded the threshold for reporting. In addition, regarding the chemicals for which a Form A was filed for 2002-2004, the total wastes of these chemicals was under the 500 pound waste threshold and the amounts processed did not exceed 1,000,000 pounds.

Regarding the chemicals for which a Form R was submitted, the inspector reviewed the data reported in the Form R's versus the facility's supporting calculations. The only discrepancies found by the inspector were very minor differences between the reported and calculated fugitive emission values for 2004 as follows:

Year	Chemical	Reported Value of Fugitive Air Emissions	Correct Value of Fugitive Air Emissions
2004	Dicyclopentadiene	1,100	1,127
2004	Ethylene Glycol	561	563
2004	Malic Anhydride	792	807
2004	Methyl Methacrylate	1,202	1,204
2004	Phthalic Anhydride	849	850
2004	Styrene	3,136	3,305

These differences arose from the inspector's observation that the facility mistakenly carried over the 2003 algorithm into its 2004 calculations. Nevertheless, this had an insignificant effect on these fugitive emissions values and these errors are not egregious enough to be characterized as a violation in accordance with EPA's *Interim Data Quality Amendment to the EPCRA Section 313 Enforcement Response Policy (ERP)*.

In conclusion, the facility has not violated the regulations at 40 C.F.R. Section 372 under EPCRA Section 313.

ASHLAND SPECIALTY CHEMICAL COMPOSITE POLYMERS
PHILADELPHIA PLANT

HISTORY

The site dates back to the turn of the century. Initially constructed in 1918 by the Grove Linseed Oil Co., the plant originally produced varnish and alkyd resins. In 1964, the plant was sold to the Cargill Company. Ashland Chemical acquired the site in 1980 and reconstructed it to produce unsaturated polyester resins.

Since the acquisition, Ashland has committed more than $15 million for improvements in plant safety, environmental controls, material handling, and process automation and expansion. The plant has grown from 21 employees producing 28 million pounds per year to 52 employees producing 90 million pounds per year.

Next door to this facility is the Publicker Superfund site. Publicker use to be one of the largest alcohol manufacturing sites in the east and was abandoned by the company in the 1980's. The 44 acre site has been cleaned and sold to Holt Oversight Technologies who utilizes the land for the open storage of steel.

A new 12,300 gal. capacity R3 reactor went on line September 1999. This reactor system replaced the former 4,800 gal. reactor that was involved in the August 20, 1998 overpressure. The new reactor has upgraded pressure relieving system capabilities consisting of a larger 16 in. diameter vent line equipped with both a rupture disc (set @ 89 psi) and a relief valve (set @ 100 psi), designed for two-phase flow. Additionally, this reactor, along with the other reactor systems have their vent lines connected with a new 28,000 gal. catch tank. This catch tank is sized based on the release of the largest reactor system, which is R3. The 1998 loss was attributed to a plugged and undersized vent system, and the lack of a catch tank which lead to the large release of chemicals. As part of the new R3 reactor system, a new 15,000 gal. capacity thin tank, TT5, was installed with work completed on April 20, 2000.

The project to tie all four reactor systems into the new Delta V distributed process control system (DCS) was completed in 2000.

In 2001, a second railcar loading rack for finished products was constructed 50 ft. east of the original loading rack, along the south side of Building No. 76. The new loading rack is identical in construction and size as the original rack. The canopy roof is corrugated metal supported by steel and is open on three sides. Automatic sprinklers were extended under the canopy.

In 2002, a project to expand the outdoor Raw Material Tank Farm by adding three new tanks was completed. The new tanks were actually "used" tanks coming from Ashland Chemical's idle Ashtabula, OH plant where they were in similar service. The tanks are located at the SE corner of the tank farm and are identified as follows:

No. 231 - 9,000 gal. – glycol
No. 241 – 20,000 gal. – ethylene glycol
No. 251 – 20,000 gal. – ethylene glycol

These new tanks are located in a common concrete dike along with the rest of the tanks. Transfer pumps are also in the dike. The tanks are filled either from rail car or tank wagon deliveries. The tanks are kept normally 92% full. Level transmitters and sensors are provided to monitor liquid level. The tanks were reportedly in good shape and were cleaned, inspected, and recertified per API guidelines.

In 2005, the Derakane vinyl ester business was acquired from Dow Chemical. A Delta V programming upgrade for Reactor 4 was added in November of 2005, and a new reactor (R5)

was installed in February of 2006. This project also included a number of tank service changes, as well as a dedicated tank and tankwagon unloading for Epoxy Novolac.

In 2005, the plant was recommended for RC 14001 certification. Philadelphia was a pilot site for this management system, and Ashland Inc. expects to be certified as a whole by 2008.

DESCRIPTION

The plant produces a variety of solvent-based, unsaturated polyester resins and vinyl esters. In the production of polyesters, acids and glycols are reacted at elevated temperatures (375-450°F). Similarly, the production process for vinyl ester resins involves the reaction of epoxy resins with glacial methacrylic acid at elevated temperatures (250-300°F). Both resins are thinned with solvents, such as styrene and methyl methacrylate, and then may be blended with additives to form the finished product.

Polyester and Vinylester resins are liquid at room temperature. The Plant's customers catalyze the resin, which causes it to harden. The customers use the resins in a wide variety of applications that include automotive body panels, fiberglass boats, shower stalls, cultured marble, tanks, and pipes.

The site covers ~4 acres, with the only available expansion to the far eastern end of the site. The rectangular site is located very near a barge slip of the Delaware River on a built-up, landfill area. Christopher Columbus Boulevard borders the west end of the site with several railroad tracks beyond. The Delaware River is a few hundred feet from the east end of the site with a vacant lot between. The Publicker site (Holt Oversight Technologies) borders the south side and utilizes the land for outdoor steel storage. The barge slip runs the length of the north fence line.

There are four main buildings including some 20,000 sq.ft of manufacturing space, 10,800 sq.ft of warehouse space, and 3,200 sq.ft. of office and lab space. There are two outdoor tank farms. There is an attached railcar loading station (open-sided canopy) located along the south wall of Building No. 76 for finished product loading, and a raw materials rail car unloading station (open-sided) at the SE section of the property used in association with the nearby raw materials tank farm. The site also has 3 truck loading canopies, fire pump house, electrical switchgear building, and other miscellaneous equipment located outdoors.

The first structure encountered at the west end of the site is **Building No. 13,** the detached Office building. This one-story, 42ft. x 42ft. structure was built in 1913 and houses the administration offices and meeting rooms. The building is non-sprinkled, however, it is manned continuously by both security and operations personnel. The building has concrete block walls with metal deck on steel bar joist roof assembly.

The bulk of production takes place in **Building No. 76**, the Main Production Building. This three-story, 55ft. x 80ft. structure, built in 1976, houses all the reactors and associated thin tanks, process control room, etc. This is a self-contained building. Building construction is primarily steel with roof composition being composite on non-combustible metal deck. Walls are of metal panel and floors are of poured concrete on steel. Overall, the structure is suitable for its occupancy. The third floor occupancy is dry material storage, liquid additive dispensing, and reactor loading operations. There are also two dust collectors on this floor for the powder chutes on the reactors. The second floor contains the process control room. This room is pressurized and equipped with a loss of positive pressurization alarm and FM-200 clean agent fire suppression system.

Also on the second floor are the intermediate reactor vessels and ancillary equipment. The first floor contains the four primary reactors, suspended on load cells. There is no

fireproofing on the reactor supports; however, sprinkler protection has been provided in lieu of fireproofing due to the load cells.

The entire building is provided with Class I, Groups C&D, Division 1 electrical installations. All pressure relief valves and rupture disks vent through a new 16 in. line into a 28,000 gal. catch tank, which is sized based on the largest reactor system (R3). To protect the building from fires involving these outside areas, a water curtain deluge sprinkler system surrounds the building perimeter, along with sprinklers protecting the various product loading stations. Due to the control room's exposure from the adjacent processing equipment, an exterior kill switch for the entire building (power) has been provided near the entrance to the building.

Maximum Working Capacities

Thin Tanks

Tank	Capacity With 922H (lbs)	Capacity With 8014 (lbs)	Capacity With 1540 (lbs)	Max Working Volume (gal)
TT-1	120,000		13,950	
TT-2	50,000		6,000	
TT-3	55,000		6,600	
TT-5	125,000		15,000	

Blend Tanks

Tank	Capacity With 922H (lbs)	Capacity With 8014 (lbs)	Capacity With 1540 (lbs)	Max Working Volume (gal)
BT-10	3,500		450	
BT-11	45,000		5,500	
BT-12	45,000		5,500	
BT-14	130,000		15,550	
BT-15	110,000		12,900	
BT-16	105,000		12,450	
BT-17	110,000		12,875	

Drum Tanks

Tank	Capacity With 922H (lbs)	Capacity With 8014 (lbs)	Capacity With 1540 (lbs)	Max Working Volume (gal)
DT-901	80,000		9,350	
DT-902	80,000		9,350	

Reactors

R1 7000gal, **R2** 4500gal, **R3** 12000gal, **R4** 6000gal, **R5** 6000gal

Building No. 10 , a Raw and Finished Product Warehouse, contains finished products in metal pressure relieving style drums stacked two-high as well as a drumming operation and Dowtherm Heater. This 93 ft. x 170 ft. building was built in 1910 and is a half one-story and half two-story structure. The building is located just east of Building No. 76 with ~15 ft. space separation between the two buildings. The structure is masonry joisted. The roof is wood joist supported by steel columns. The second floor is concrete. Exterior building walls are masonry. The drumming operation is on the first floor (northwest corner) in a cut-off room with 3hr. fire doors. There's an emergency stop system cutting off the product stream to the manual fill stations and a sprinkler system protecting the room. Class 1, Division 1 electrical equipment is used throughout the first floor. A Dowtherm heating unit (boiler) is located in the southeast corner. The hot oil heater contains approximately 2,500 gallons of Dowtherm, most of it in an expansion tank located on the roof. The heater is protected by a sprinkler system and is located in a semi-detached area of the building. The majority of the first floor is

used as a storage area for bagged raw materials, finished product (flammable liquids) in 55 gallon drums to about 8 ft. high. The finished product is shipped as soon as possible; however, there is always a good deal of storage maintained in this warehouse. The entire building is protected by a sprinkler system. The second floor of the building contains offices, locker and break rooms, and QC laboratories. There is also a small masonry cutoff room located at the SW corner of the building which houses a 900 KVA emergency generator.

Building No. 97, consists of offices, maintenance shop, and spare parts storage. This is a 50 ft. x 80 ft. 1=2 story building constructed in 1997, and has an office mezzanine. The building is well detached from the rest of the buildings (~280 ft. east of Building No. 10) but is in close proximity to the #2 diesel fuel oil storage tank. The building is light noncombustible with metal panel walls and a metal deck roof. The building is protected with a dry pipe sprinkler system that is fed from the system in Building 10.

The **Raw Material Tank Farm** is located directly SE of Building No. 10 and contains 20 storage tanks. The tanks are all cone roof with most of them sized to hold roughly 15,000 gallons of product. Tank levels were previously monitored by programmable logic controllers, but a project was recently completed that replaced the PLC's and converted the tank sensors over to the plant's Delta V DCS control system. All tanks are equipped with high and high/high level alarms. Tanks that are fed from rail cars are provided with high level interlocks. A 4ft. concrete dike surrounds the tanks and is capable of holding at least the volume of the largest tank.

All tanks are nitrogen blanketed; venting is adequate and connected via flame arrestors to the afterburner (thermal oxidizer) for emissions control. There are two pull stations in the tank farm area for emergency notification. Tanks are mostly supported on concrete pads, though there are a few on steel legs. Heated tanks are on a tempered hot water heating system.

There is a truck unloading station and one rail car unloading platform next to the raw material tank farm. The area is protected by portable fire extinguishers, a wheeled dry chemical unit, and a new ground level water monitor, which is located north of these stations. Styrene monomer unloading is performed at the rail rack.

Previously all transfer pumps were of the mechanical-seal type. All pumps have recently been converted to "sealess" magnetic drive type, which is an improvement.

The **Finished Product Tank Farm** is located west of building No. and contains 15 storage tanks. The tanks are all cone roof with capacities of about 15,000 gallons. A 4ft. concrete dike is provided around the perimeter. Protection of the tank farm is primarily from nearby hydrants along Christopher Columbus Boulevard. Exposures adjacent to the tank farm are protected with sprinkler systems (i.e. the truck product loading stations and Building No. 76). The tanks are strapped quarterly for level instrument verification. Spring-loaded safety shutoff off valves are provided on the discharge lines of each tank.

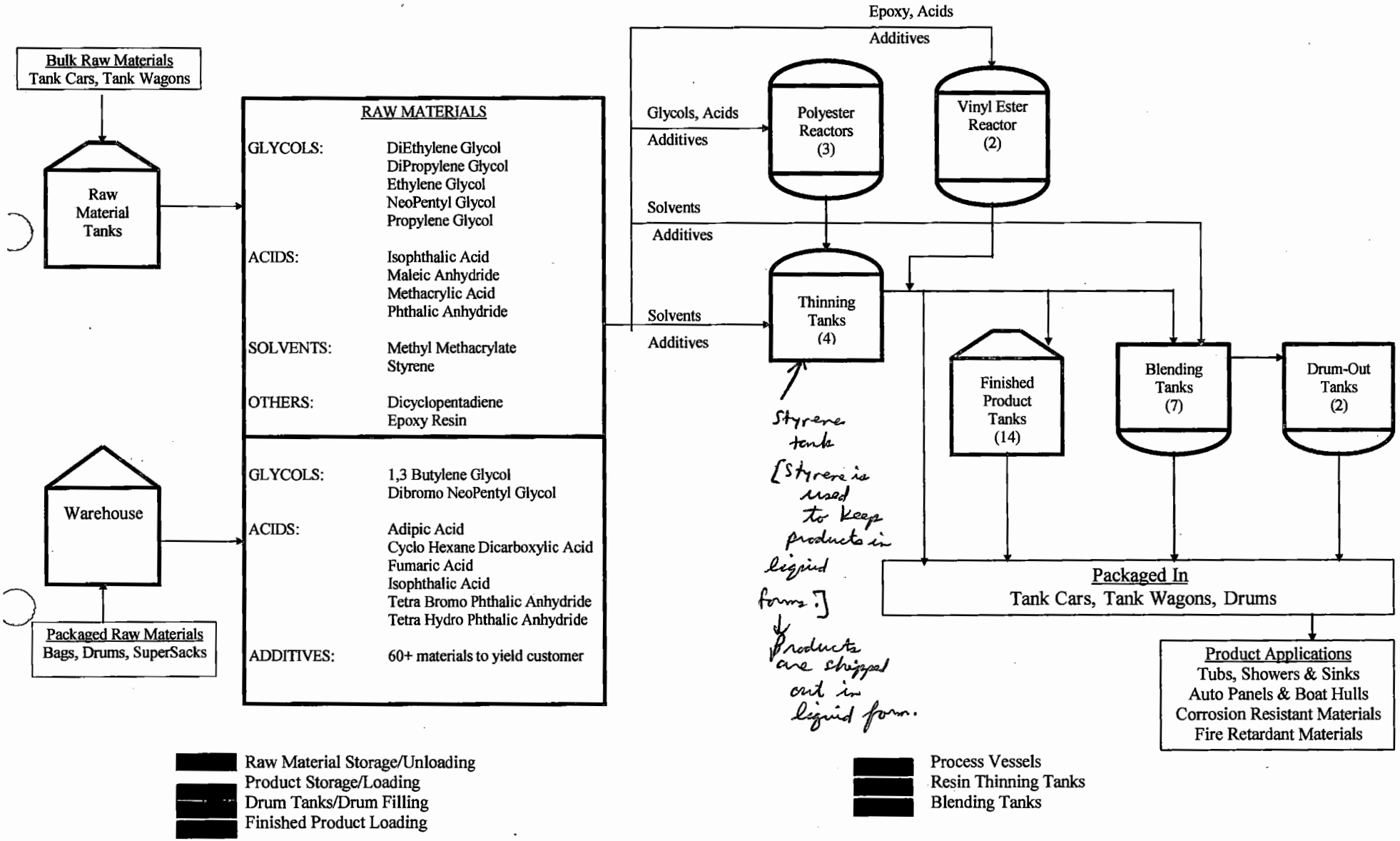
In 2002, work was completed to install new sensors on the finished product storage tanks which detect a high and a high-high liquid level with subsequent interlock to shut off the associated transfer pump. The new sensors are tied into the plant's DCS system. The more volatile raw material storage tanks already have these "upgraded" level sensors and interlocks.

There are some additional structures, mainly three truck product loading canopies and an after-burner (gas-fired thermal oxidizer) skid which are located north of Building No. 76. The truck loading stations are adequately protected by water spray systems.

ASHLAND CHEMICAL

Philadelphia Composite Polymers Plant

Facility Material Flow



DOCUMENT 3

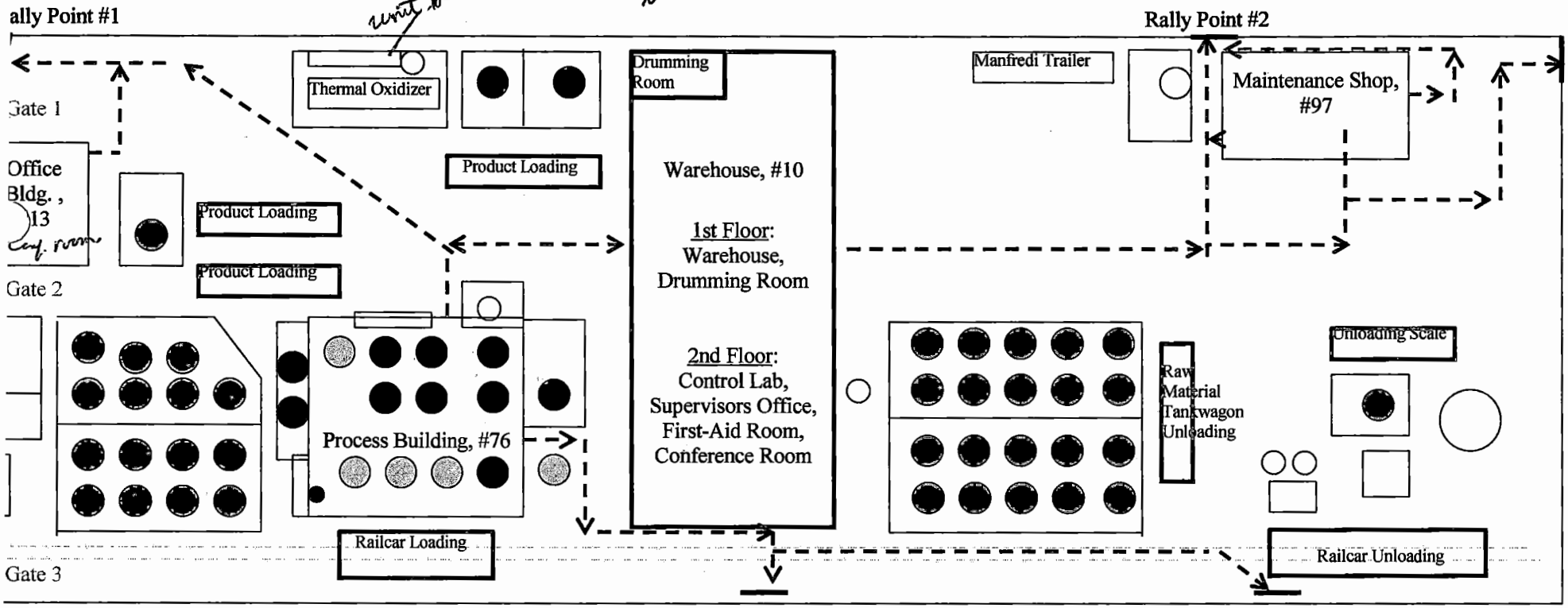
ASHLAND CHEMICAL

Philadelphia Composite Polymers Plant

Thermal oxidizer does both treatment and energy recovery. The unit has waste heat boiler as well as regular treatment.

4 acre site

PLANT MAP



- Raw Material Storage/Unloading
- Product Storage/Loading
- Drum Tanks/Drum Filling
- Emergency Exits/Rally Points
- Process Vessels
- Resin Thinning Tanks
- Blending Tanks
- Evacuation Route